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## Glass in building — Laminated glass and laminated safety glass —

### Part 1: Definitions and description of component parts

*Verre dans la construction — Verre feuilleté et verre feuilleté de sécurité —*

*Partie 1: Définitions et description des composants*

ICS: 81.040.20; 01.040.81

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 160, *Glass in building* Subcommittee SC 1, *Product considerations*.

This third edition cancels and replaces the second edition (ISO 12543-1:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

- Editorial changes
- ....

A list of all parts in the ISO 12543 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Glass in building — Laminated glass and laminated safety glass —

## Part 1: Definitions and description of component parts

### 1 Scope

This part of ISO 12543 defines terms and describes component parts for laminated glass and laminated safety glass for use in building.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 472, *Plastics — Vocabulary*

### 3 Terms and definitions (standards.iteh.ai)

For the purposes of this document, the following terms and definitions apply.

Note 1 to entry Definitions 2.3 onwards apply to both laminated glass and laminated safety glass.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **Laminated glass**

assembly consisting of one sheet of glass with one or more sheets of glass and/or plastic glazing sheet material joined together with one or more interlayers

Note 1 to entry: See ISO 12543-3.

#### 3.2

##### **laminated safety glass**

laminated glass classified in accordance with a soft body impact standard where in the case of breakage the interlayer serves to retain the glass fragments, limits the size of opening, offers residual resistance and reduces the risk of cutting or piercing injuries.

Note 1 to entry: See ISO 12543-2.

#### 3.3

##### **fire-resistant laminated glass**

laminated glass where at least one interlayer reacts to the high temperature to give the product its fire resistance

Note 1 to entry: Fire resistant laminated glass can also contain glass components which are themselves fire resistant.

Note 2 to entry: A glass product can only have its fire performance determined and classified when used in a fire resistant glazed assembly.

### 3.4 laminated glass with fire-resistant properties

laminated glass which achieves its fire resistance by means of the performance of one or more of its glass components, which are kept after lamination, and not by means of interlayer(s)

Note 1 to entry: No glass product in itself can be classified as fire resistant. When the glass product is glazed into an appropriate frame system, the assembly can be tested and classified as fire resistant. This type of laminated glass can be used as a component in a fire-resisting glazed assembly.

### 3.5 laminated glass with acoustic properties

laminated glass where at least one interlayer increases the sound transmission loss of the product

Note 1 to entry: The interlayer can be evaluated in accordance with ISO 16940, which measures the mechanical impedance of laminated glass.

### 3.6 symmetrical laminated glass

laminated glass in which, from both outer surfaces, the sequence of glass panes, plastic glazing sheet material and interlayer(s) by type, thickness, finish and general characteristics are the same

### 3.7 asymmetrical laminated glass

laminated glass in which, from both outer surfaces, the sequence of glass panes, plastic glazing sheet material and interlayer(s) by type, thickness, finish and/or general characteristics is different

### 3.8 flat laminated glass

laminated glass in which the constituent glass panes and plastic glazing sheet material have not been formed or bent in the course of manufacture

### 3.9 curved laminated glass

laminated glass in which the constituent glass panes and plastic glazing sheet material have been deliberately shaped by forming or bending prior to laminating

### 3.10 interlayer

one or more layers of material acting as an adhesive and separator between plies of glass and/or plastic glazing sheet material

Note 1 to entry: The interlayer can also give additional performance to the finished product, for example impact resistance, resistance to fire, solar control and acoustic insulation.

Note 2 to entry: The interlayer itself can also encapsulate non-adhesive films and plates, wires, grids, etc.

### 3.11 encapsulated material

non-adhesive material that is encapsulated by an interlayer between the glass and/or plastic glazing material

Note 1 to entry: The non-adhesive material can be a film, plate, wire, grid, etc.

### 3.12 film

thin planar product of arbitrarily-limited maximum thickness in which the thickness is very small in proportion to length and width

Note 1 to entry: Film is generally supplied in roll form.

**3.13****plate**

smooth, flat piece of material of uniform limited thickness that may be perforated

**3.14****grid**

regular arrangement of wires

**3.15****folio lamination process**

lamination process where the interlayer is a solid film which is placed between the plies of glass or plastic glazing sheet material and is then subjected to heat and pressure to produce the final product

Note 1 to entry: The pressure can be higher or lower than the ambient pressure.

**3.16****cast-in-place lamination process**

lamination process where the interlayer is obtained by pouring a liquid between the plies of glass or plastic glazing sheet material and is then chemically or ultraviolet cured to produce the final product

Note 1 to entry: Lamination processes other than those defined in 2.15 and 2.16 are available, but they do not necessarily fit into either of the two methods defined in 2.15 and 2.16.

**3.17****stock sizes**

sizes which are intended to be recut or processed for final use

**3.18****finished sizes**

sizes which are either manufactured to size or cut from stock sizes and may be further processed

Note 1 to entry: Examples of further processing can include edge worked, drilled or face decorated.

## 4 Description of component parts

### 4.1 General

Laminated glass shall be manufactured from the combinations of glass, plastic glazing sheet material and interlayers described in [3.2](#) to [3.5](#), as specified in ISO 12543-2 or ISO 12543-3.

NOTE 1 Laminated glass can also be read as laminated safety glass.

NOTE 2 The description of component parts in this clause is not exhaustive.

Some plastic glazing materials, interlayers, films, plates, wires and grids are subject to standardization. If materials are not subject to standardization, they should be subject to the laminated glass manufacturer's specifications. These specifications are usually subject to the manufacturer's own quality procedures for factory production control or the quality assurance system.

NOTE 3 Standardization of plastics can be covered by ISO 472.

### 4.2 Glass composition and type

Glass compositions and types are the subject of product standards (see [Annex A](#) for EN product standards or Reference [\[4\]](#)).

#### 4.2.1 Glass composition

Glass compositions of laminated glass may be one of the following:

- soda lime silicate glass;
- borosilicate glass;
- alkaline earth silicate glass;
- alumino silicate glass;
- glass ceramics.

#### 4.2.2 Glass type

The type of glass used in laminated glass may be:

- float glass;
- drawn sheet glass;
- patterned glass;
- polished wired glass;
- wired patterned glass.

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#### 4.2.3 Other characteristics of glass (standards.iteh.ai)

The glass may also be:

- clear or tinted; <https://standards.iteh.ai/catalog/standards/sist/2c60a5fd-f464-4a55-9301-f07eb134712d/iso-dis-12543-1>
- transparent, translucent or opaque;
- annealed, heat strengthened, thermally toughened (tempered), heat soaked thermally toughened (tempered) or chemically strengthened ;
- surface treated (e.g. by sandblast or acid etched).
- coated, painted or silvered

#### 4.3 Plastic glazing sheet material

Plastic glazing sheet material may be manufactured from:

- a) polycarbonate;
- b) acrylic.

The plastic glazing materials may be:

- clear, tinted or coated;
- transparent or translucent.

#### 4.4 Interlayers

Interlayers (when they are components of the completed laminate) can differ by:

- a) material type and composition;



- b) mechanical characteristics;
- c) optical characteristics.

Interlayers may be:

- clear or tinted;
- transparent, translucent or opaque;
- coated or printed.

#### **4.5 Films, plates, wires and grids**

Films, plates, wires and grids can differ by:

- material type and composition;
- mechanical characteristics;
- optical characteristics.

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